

Application No. 10/665,100
Amendment dated April 26, 2005
Reply to Final Office Action of February 1, 2005

Docket No. 1 32-5157

REMARKS

Prior to examination on the merits, entry of the following Amendment is respectfully requested. Applicants respectfully request reconsideration of this application in view of the foregoing amendment and following remarks.

Status of the Claims

Claims 10-23 are pending in this application. Claims 10 and 17 are independent. All of the pending claims are rejected. By this amendment, all of the pending claims (i.e., 10-23) are cancelled without prejudice or disclaimer. New claims 24-37 are added. No new matter has been added by this amendment.

Rejection under 35 U.S.C. §§ 112 & 102

Claims 17-23 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Examiner indicates that “[s]upport was not found in the disclosure ... for the apparatus limitations ‘a first processing unit...a second processing unit...’ and limitations of the dependent claims...”

Claims 10-23 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Application Publication No. US2002/0042664A1 to Kikuchi (“Kikuchi”).

Claims 10-23 have been cancelled rendering the rejections directed to these claims moot.

New Claims

New claims 24-37 have been added to recite the claimed invention in an alternative manner. Specifically, added independent claim 31 recites among other things “a first processing unit to process the image data with each of a plurality of signal processing methods, with respect to each of positions of the marks, to obtain a position to the mark in the image data with respect

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to each of the plurality of signal processing methods; and a second processing unit to obtain an expression approximately representing the positions of the plurality of regions with respect to each set of the obtained positions, each of the obtained positions being obtained with one of the plurality of signal processing methods, to evaluate approximation degrees of the expressions, and to select one of the plurality of signal processing methods with respect to each of positions of the marks based on the evaluation results.” Added independent claim 24 recites similar features to claim 31 in a method claim. Support for the added claims may be found throughout the original specification including page 23, lines 25-27.

The invention enables a high-precision detection without detracting from the precision of alignment mark detection even in a case where there is an error in the position of an alignment mark formed on a wafer. See, for example, lines 17-23 of page 6 of the original specification.

Applicants note that added claim 31 recites the similar elements to cancelled claim 17, i.e., the “first processing unit” and “second processing unit,” for which the Examiner rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

First of all, Applicants note that Fig. 1 of the original specification illustrates an exposure apparatus of the present invention in which SIGNAL PROCESSOR 16 and CENTRAL PROCESSING UNIT 17 are shown among other things. Additionally, portions of the original specification describe the invention with different perspectives. For example, page 14, lines 7-16 of the original specification describes that the signal processor 16 calculates position information of the alignment mark 30 based on the image pick-up signal, and the central processing unit 17 positions the wafer stage so as to correct positional deviation based on the position information

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calculated by the signal processor 16. Another portion of the specification (e.g., page 18, lines 15-24) describes that the positional information is obtained using two types of template (i.e., templates A and B).

Given the descriptions as cited above and other teachings of the original specification along with the figures, Applicants believe that an ordinary person skilled in the art would understand the invention of claims 24 and 31 including the first and second processing units.

Secondly, Kikuchi fails to show or suggest the present invention as featured in added claims 24 and 31 as discussed above. For example, Kikuchi discloses an evaluation method/apparatus for evaluating/eliminating a nonlinear distortion of part of a substrate in which a statistic computation is used using the measured position information to thereby calculate the degree of the nonlinearity. Paragraph 0040 of Kikuchi describes "a first position detection method, wherein said measured position information is in accord with position deviations of said divided areas..., and wherein by performing a statistic computation using said measured position information..." Paragraph 0048 of Kikuchi describes "the second position detection method..., wherein said nonlinear component of a piece of position information ... is calculated based on a single complement function..."

There is nothing in Kikuchi, however, that teaches the invention of claims 24 and 31 as discussed above including the first and second processing units/steps. It appears that Kikuchi's two methods are independent methods each other used depending on the number of the substrate (e.g., nth substrate). Moreover, Applicants believe that Kikuchi teaches away at least the step of the first processing unit in claims 24 and 31, i.e., processing the image data with each of a plurality of signal processing methods, with respect to each of positions of the marks, to obtain a

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position to the mark in the image data with respect to each of the plurality of signal processing methods.

Accordingly, each of added independent claims 24 and 31, and claims dependent therefrom (i.e., claims 25-30 and 32-37) are believed to be allowable in view of Kikuchi for at least the reasons discussed above.

Applicants believe that the application is in condition for allowance and such action is respectfully requested.